WHEEL AND TIRE SYSTEM

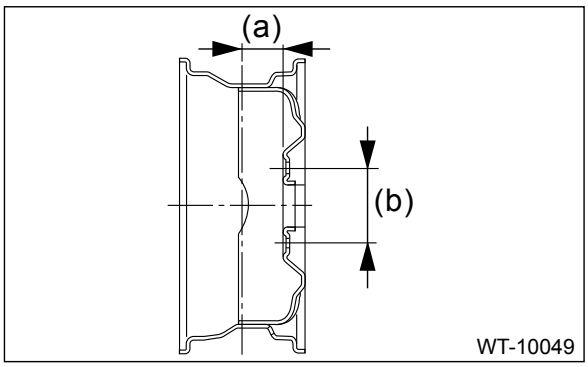
WT

CAUTION

- When performing service operation, refer to "Repair Contents" in "General Description". Ref. to REPAIR CONTENTS>Repair Contents.
- When performing any work, always wear work clothes, a work cap and protective shoes. Additionally, wear a helmet, protective goggles, etc. if necessary.
- When performing work on the sensors or modules, be careful of the following.
  - Before disconnecting electrical connectors, be sure to disconnect the ground terminal from the battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
  - Do not apply any impact. If the parts are accidentally dropped, replace with a new part.
  - Do not expose to high-temperature and humidity.
- Refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM" section. Ref. to AIRBAG SYSTEM>General Description>CAUTION.

SPECIFICATION

1. NOTE



(a) Inset

(b) P.C.D.

Note:

- **Size and inflation pressure of the standard equipment tire, spare tire, and appropriate tire for equipment are described on the "Tire inflation pressure" label attached to the body side of the driver's door.**
- **A spare tire is equipped instead of the tire puncture repair kit depending on the destination.**

2. STANDARD EQUIPMENT TIRE, SPARE TIRE & WHEEL

Tire size	Wheel size	Inset mm (in)	P.C.D. mm (in)	Tire inflation pressure kPa (kgf/cm^2, psi)	
				Front wheel	Rear wheel
215/45R17 87W	$17 \times 7^1/_2$ J	48 (1.89)	100 (3.9)	240 (2.4, 35)	240 (2.4, 35)

215/40R18 85Y	18 × 7 1/2 J	48 (1.89)	100 (3.9)	240 (2.4, 35)	240 (2.4, 35)

3. SERVICE DATA

Part	Axial runout	Radial runout
Alloy wheel	1 mm (0.04 in)	

Wheel balancing	Standard	Service limit
Dynamic unbalance	10 g (0.35 oz) or less	

WHEEL AND TIRE SYSTEM > General Description

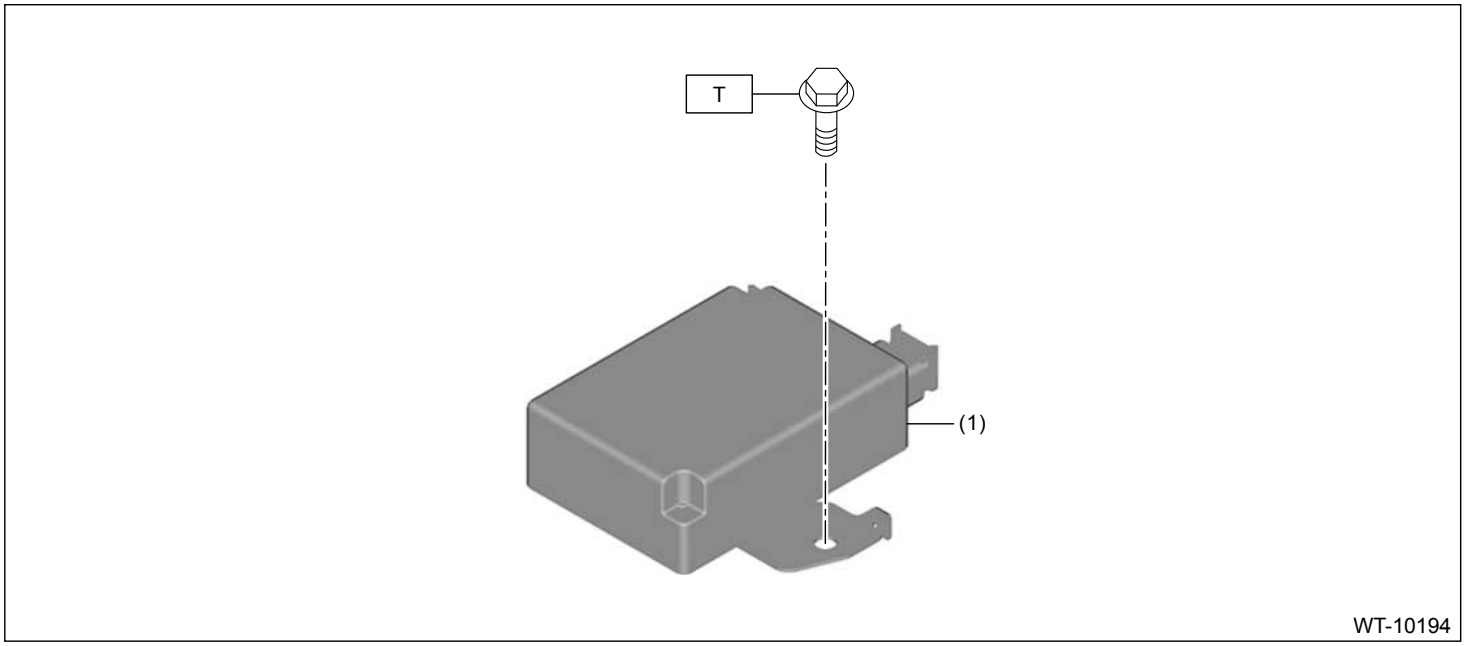
LOCATION

1. TIRE PRESSURE MONITORING SYSTEM

For location, refer to "Electrical Component Location" for the "TIRE PRESSURE MONITOR (DIAGNOSTICS)" section. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Electrical Component Location.

WHEEL AND TIRE SYSTEM > General Description

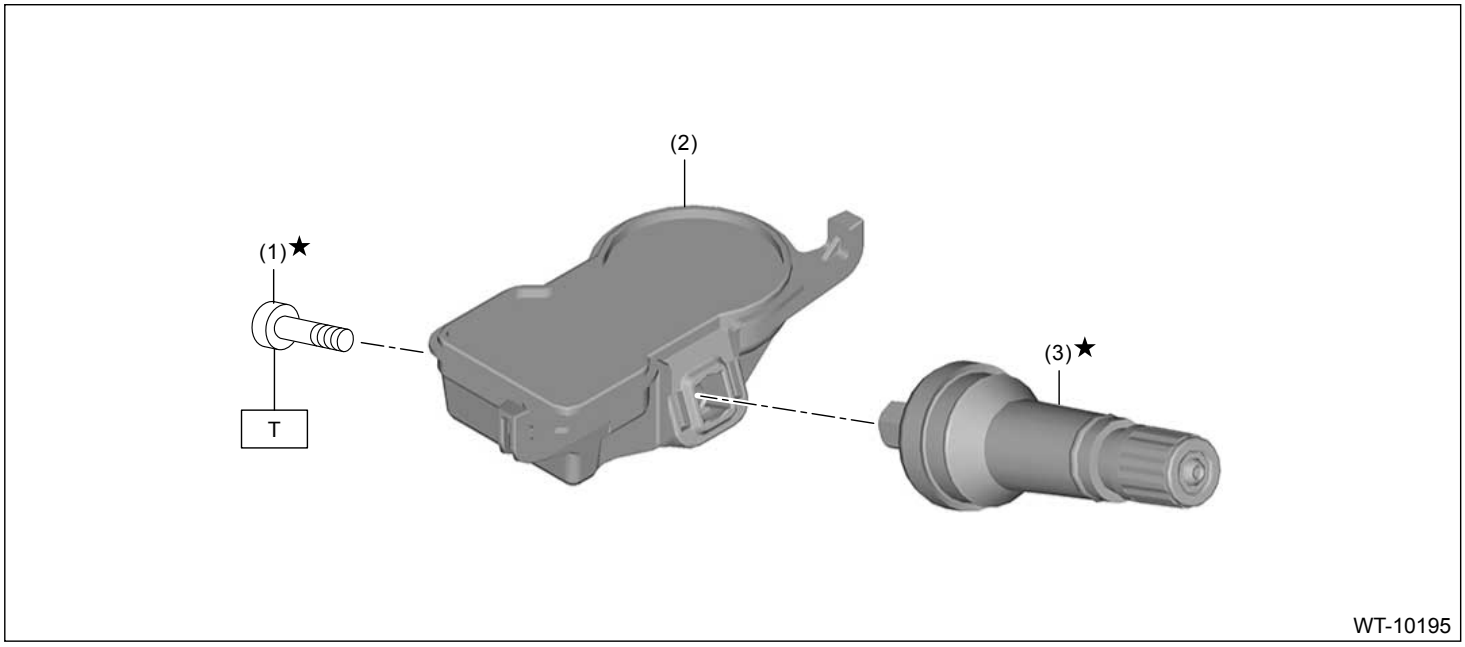
COMPONENT



(1) TPMS CM

Tightening torque: N·m (kgf-m, ft-lb)

T: 13 (1.3, 9.6)



(1) TORX® screw

(2) Transmitter (tire inflation pressure sensor)

(3) Valve

Tightening torque: N·m (kgf-m, ft-lb)

T: 1.2 (0.1, 0.9)

WHEEL AND TIRE SYSTEM > General Description

PREPARATION TOOL

1. SUBARU SPECIAL TOOL

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 STSSM4	—	SUBARU SELECT MONITOR 4	Used for setting of each function and troubleshooting for electrical system. **Note:** • **For detailed operation procedures, refer to "Help" of application.** • **Used together with interface for Subaru Select Monitor (such as DST-i and DST-010).**

2. OTHER

	REMARKS
Air pressure gauge	Used for measuring tire air pressure.
Dial gauge	Used for measuring wheel runout.
Magnet stand	Used for measuring wheel runout.
Transmitter registration tool	Used to register the transmitter ID.

	Manufacturer: Latest model of ATEQ Corp. Or, use an ATEQ model with the updated software compatible with Generation6 transmitter. **Note:** **For details of the software update, registration procedures and retailers, contact ATEQ in your country.**
TORX® T10	Used for removing and installing transmitter (tire inflation pressure sensor).
Wheel balancer	Used for adjusting wheel balance.

WHEEL AND TIRE SYSTEM > Tire and Wheel

REMOVAL

1. Lift up the vehicle.
2. Remove the wheel nut.
3. Remove the wheels.

Caution:
When removing the wheels, be careful not to damage the hub bolts.

WHEEL AND TIRE SYSTEM > Tire and Wheel

INSTALLATION

1. Install the wheels to vehicle.
2. Temporarily install the wheel nuts.
3. Lower the vehicle.
4. Tighten the wheel nuts to the specified torque.

Tightening torque:
120 N·m (12.2 kgf-m, 88.5 ft-lb)

WHEEL AND TIRE SYSTEM > Tire and Wheel

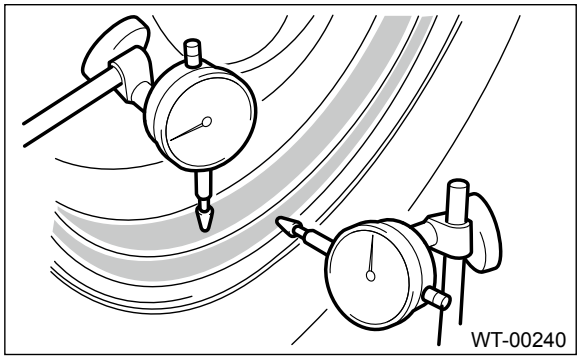
INSPECTION

1. TIRES

Caution:
When replacing a tire, make sure to use tires of the same size, construction and load range as originally installed.

1. Check the tire size and tire inflation pressure. Ref. to WHEEL AND TIRE SYSTEM>General Description>SPECIFICATION.
2. Check for cracks, damage and wear.
3. Check the tire runout.
   (1) Lift up the vehicle.
   (2) Slowly rotate the wheel to check rim axial and longitudinal runout using a dial gauge and a magnet stand.

   Service limit:
   1 mm (0.04 in)



(3) After inspection, if the runout of the rim exceeds the limit, check the hub unit bearing.

4. If the rim runout exceeds service limit, perform the following confirmations.

(1) Mark the locations where the service limit is exceeded, move the tire installation position, and perform the inspections above again. Check if the locations that exceed the service limit change.

(2) If the locations do not change, replace the wheel.

(3) If the locations change, check the hub unit bearing.

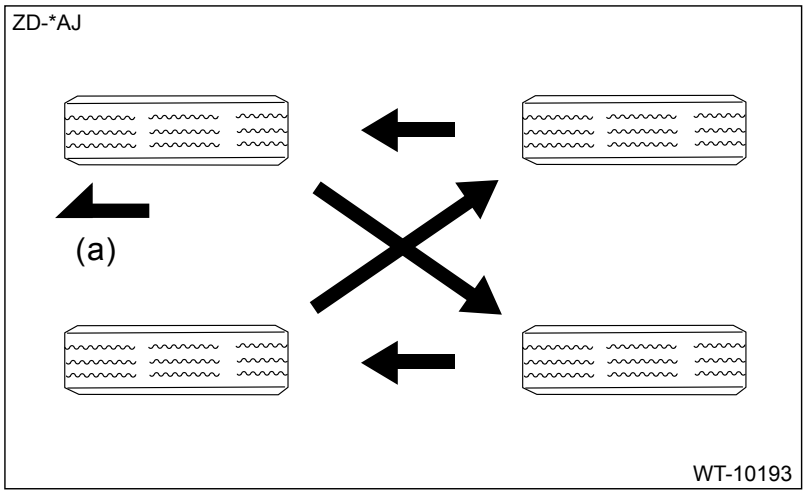
- Front: Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>INSPECTION.
- Rear: Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Rear Hub Unit Bearing>INSPECTION.

2. TIRE ROTATION

Note:
Rotate tires periodically (10,000 km (6,000 miles)) in order to prolong life and to prevent uneven wear.

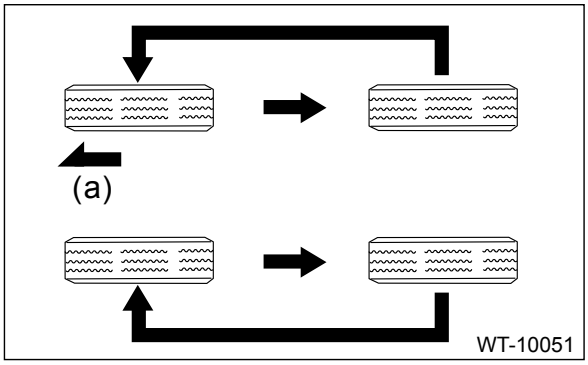
Rotate tires as shown in the figure depending on whether or not the direction of the tire rotation is specified and whether or not a spare tire is equipped.

- When the direction of tire rotation is not specified



(a) Front side of vehicle

- When the direction of tire rotation is specified



(a) Front side of vehicle

3. WHEEL BALANCING

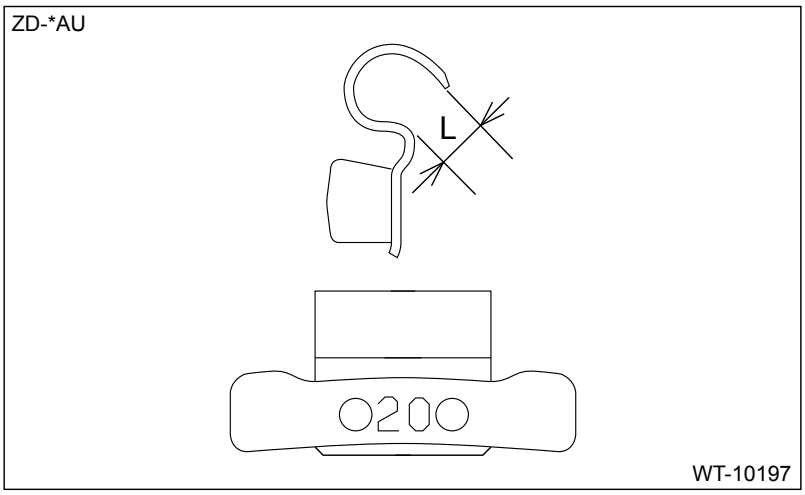
1. Using the wheel balancer, measure wheel balance.
2. Adjust the wheel balancing.

Note:

- **Unbalance after adjusting the wheel balancing should be 10 g (0.35 oz) or less.**
- **When using the adhesive type weight, degrease the surface where the adhesive type weight will be applied securely.**
- **After applying the adhesive type weight, apply a force to the weight and attain full adhesion.**
- **Using the knock-on type weight, check the size of the knock-on part.**

Service limit L:

5 mm (0.2 in)



WIRING DIAGRAM

For the wiring diagram, refer to “Tire Pressure Monitoring System” in the wiring diagram. Ref. to WIRING SYSTEM>Tire Pressure Monitoring System>WIRING DIAGRAM.

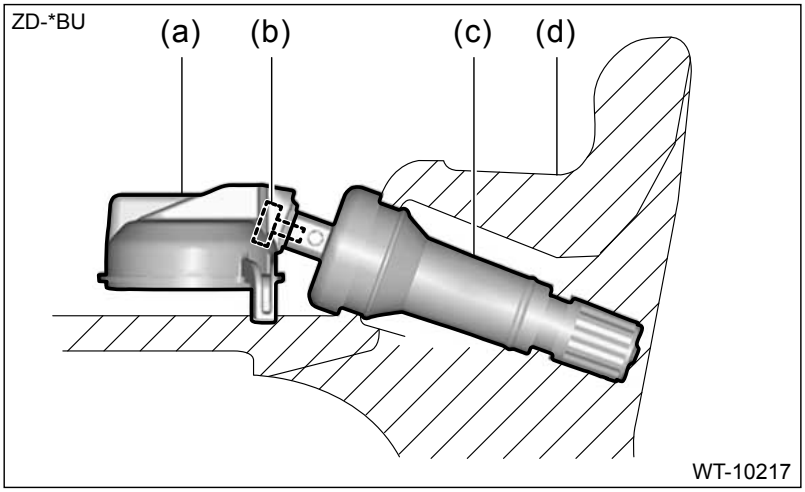
REMOVAL

1. TRANSMITTER (TIRE INFLATION PRESSURE SENSOR)

1. Remove the wheels. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>REMOVAL.
2. Remove the tires from wheels.

Caution:
Use a tire changer when removing the tire from the wheel.

3. Using TORX® T10, remove the screw, and then remove the transmitter (tire inflation pressure sensor) from the valve.



(a) Transmitter (tire inflation pressure sensor)
(b) Screw
(c) Valve
(d) Wheel

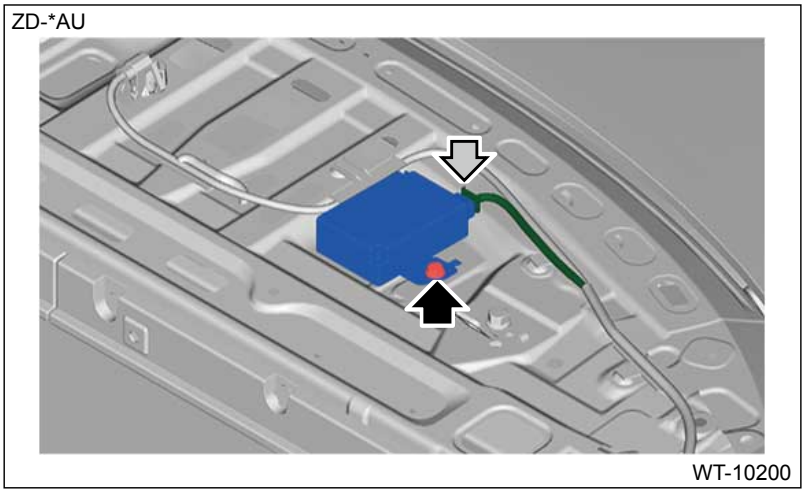
4. Remove the valve from the wheel.

2. TPMS CM

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not drop the TPMS CM or apply impact on it.**
- **When replacing or inspecting the TPMS CM, do not change the wiring route or the length of the harness around the TPMS CM.**

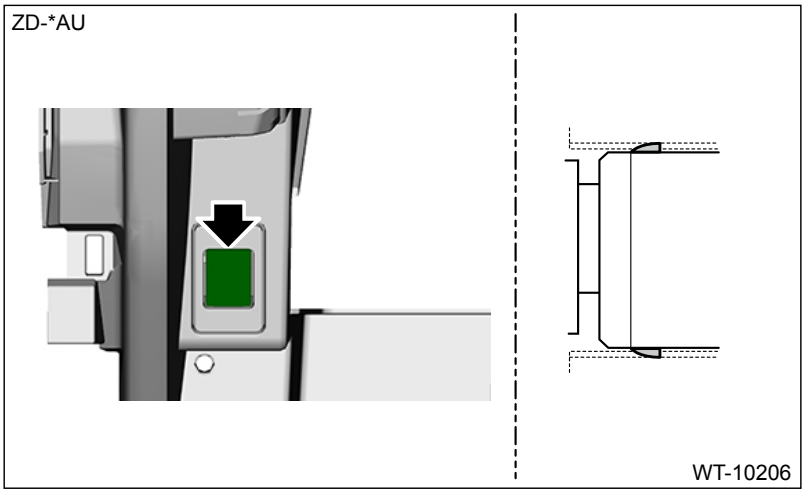
1. Disconnect the ground terminal from the battery sensor, and wait for at least 60 seconds before starting work. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the cushion assembly rear seat and the backrest assembly rear seat. Ref. to SEATS>Rear Seat>REMOVAL.
3. Remove the cover side sill front Rr and the cover side sill front Ft. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>REMOVAL.
4. Remove the weather strip body side flange front. Ref. to EXTERIOR BODY PANELS>Weather Strip>REPLACEMENT.
5. Remove the trunk trim panel side. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>REMOVAL.
6. Remove the trim panel assembly quarter and the trim panel assembly C pillar rear. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>REMOVAL.
7. Remove the trim panel assembly rear shelf. Ref. to EXTERIOR/INTERIOR TRIM>Rear Shelf Trim>REMOVAL.
8. Remove the TPMS CM.
   (1) Disconnect the connector.
   (2) Remove the bolts to remove the TPMS CM.



3. TPMS SET SWITCH

1. Disconnect the ground terminal from battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.
2. Remove the pocket COMPL. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>REMOVAL > GLOVE BOX LID.
3. Remove the TPMS SET switch.
   (1) Disconnect the connector.

(2) Release the claws and remove the TPMS SET switch.



WHEEL AND TIRE SYSTEM > Tire Pressure Monitoring System

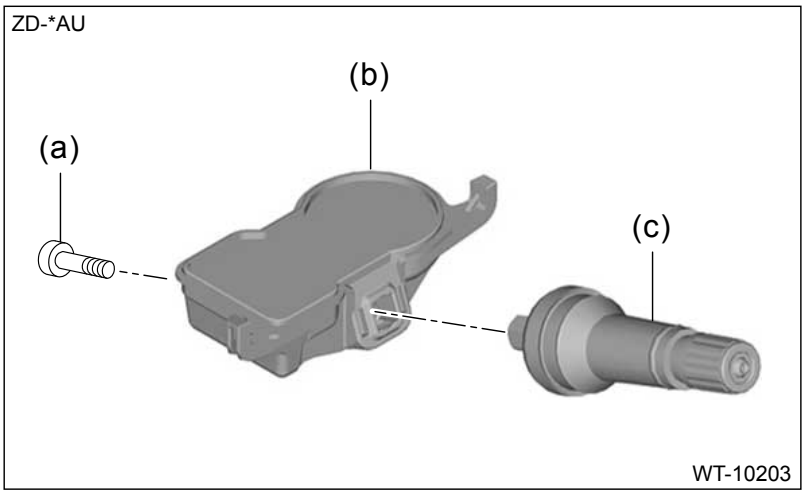
INSTALLATION

1. TRANSMITTER (TIRE INFLATION PRESSURE SENSOR)

1. When reusing the transmitter (tire inflation pressure sensor), replace the valve and TORX® screw with new parts before installing.

Tightening torque:

1.2 N·m (0.1 kgf-m, 0.9 ft-lb)



(a) TORX® screw

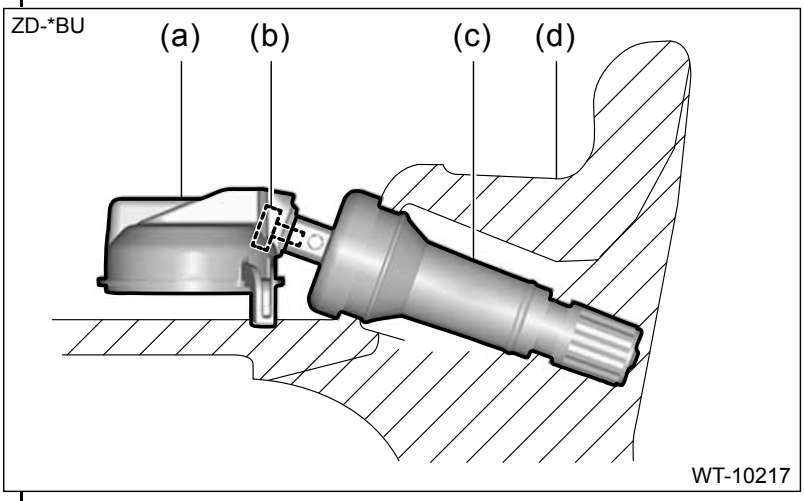
(b) Transmitter (tire inflation pressure sensor)

(c) Valve

2. Install the transmitter (tire inflation pressure sensor) to the wheel by aligning it with valve hole.

Note:

- **When using the jig that pulls the valve cap by hooking its neck part, use another short-type cap.**
- **Install the transmitter (tire inflation pressure sensor) as shown in the figure below.**

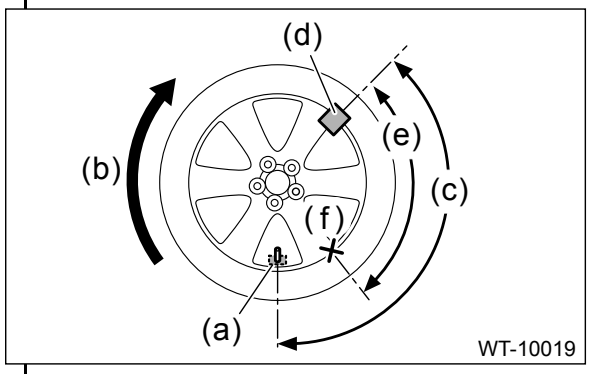


(a) Transmitter (tire inflation pressure sensor)
(b) Screw
(c) Valve
(d) Wheel

3. Install the tires to wheels.

Caution:

- **Use a tire changer when installing tire to wheel.**
- **To prevent damaging the transmitter (tire inflation pressure sensor), set the tire changer boom in the position as shown in the figure.**



(a) Transmitter (tire inflation pressure sensor)
(b) Direction of turn table rotation
(c) 135°
(d) Tire changer boom
(e) 90°
(f) Starting point for fitting the bead to the rim

4. Install the wheel. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSTALLATION.

5. If the transmitter (tire pressure sensor) is replaced, register its ID. Ref. to TIRE PRESSURE

MONITOR(DIAGNOSTICS)>Register Transmitter (ID).

2. TPMS CM

Caution:

- **Before handling the airbag system components, refer to "CAUTION" of "General Description" in "AIRBAG SYSTEM". Ref. to AIRBAG SYSTEM>General Description>CAUTION.**
- **Do not drop the TPMS CM or apply impact on it.**
- **When replacing or inspecting the TPMS CM, do not change the wiring route or the length of the harness around the TPMS CM.**

1. Install the TPMS CM.
   Tightening torque:
   13 N·m (1.3 kgf-m, 9.6 ft-lb)
2. Connect the connector to TPMS CM.
3. Install the trim panel assembly rear shelf. Ref. to EXTERIOR/INTERIOR TRIM>Rear Shelf Trim>INSTALLATION.
4. Install the trim panel assembly C pillar rear and the trim panel assembly quarter. Ref. to EXTERIOR/INTERIOR TRIM>Rear Quarter Trim>INSTALLATION.
5. Install the trunk trim panel side. Ref. to EXTERIOR/INTERIOR TRIM>Trunk Room Trim>INSTALLATION.
6. Install the weather strip body side flange front. Ref. to EXTERIOR BODY PANELS>Weather Strip>REPLACEMENT.
7. Install the cover side sill front Ft and the cover side sill front Rr. Ref. to EXTERIOR/INTERIOR TRIM>Lower Inner Trim>INSTALLATION.
8. Install the backrest assembly rear seat and the cushion assembly rear seat. Ref. to SEATS>Rear Seat>INSTALLATION.
9. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

3. TPMS SET SWITCH

1. Install the TPMS SET switch.
2. Connect the connector to the TPMS SET switch.
3. Install the pocket COMPL. Ref. to EXTERIOR/INTERIOR TRIM>Glove Box>INSTALLATION > GLOVE BOX LID.
4. Connect the ground terminal to battery sensor. Ref. to REPAIR CONTENTS>NOTE > BATTERY.

WHEEL AND TIRE SYSTEM > Tire Pressure Monitoring System

INSPECTION

1. BASIC INSPECTION

For basic inspection, refer to "Basic Diagnostic Procedure" of "TIRE PRESSURE MONITOR (DIAGNOSTICS)".
Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Basic Diagnostic Procedure.

2. SYSTEM BLOCK DIAGRAM

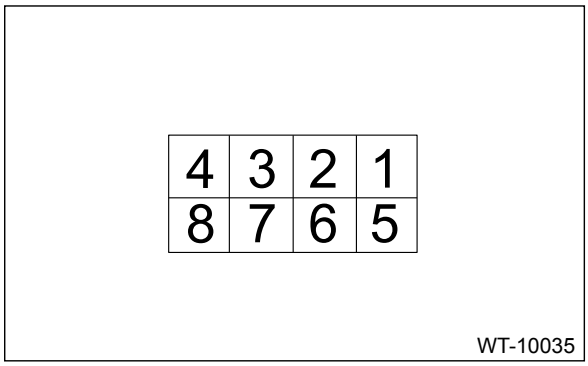
For system block diagram, refer to “System Block Diagram” in “TIRE PRESSURE MONITOR (DIAGNOSTICS)”. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>General Description>SYSTEM BLOCK DIAGRAM.

3. MODULE I/O SIGNAL

For the specification (electrical component), refer to “Control Module I/O Signal” of “TIRE PRESSURE MONITOR (DIAGNOSTICS)”. Ref. to TIRE PRESSURE MONITOR(DIAGNOSTICS)>Control Module I/O Signal>ELECTRICAL SPECIFICATION.

4. TPMS SET SWITCH

1. Measure the resistance between the TPMS SET switch terminals.



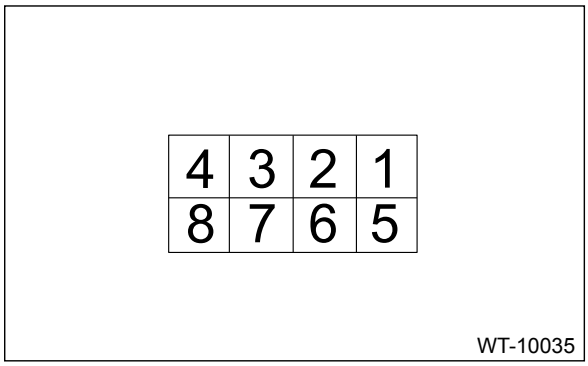
Terminal No.	Inspection conditions	Standard
6 — 8	Switch OFF	950 Ω — 1,050 Ω
	Switch ON	1 Ω or less

2. Apply battery voltage between the connector terminals to check lighting condition of illumination inside the switch.

Caution:

When applying battery voltage, do not mix up the positive (+) side and the negative (−) side.

Incorrect polarity connection may cause LED damage inside the switch.



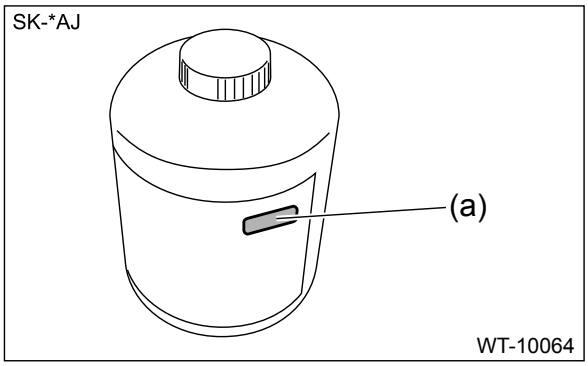
Terminal No.	Inspection conditions	Specification
1 (+) — 4 (−)	Apply battery voltage.	Light ON

3. Replace the TPMS SET switch if it is found defective.

WHEEL AND TIRE SYSTEM > Tire Repair Kit

NOTE

- Refer to the owner's manual for the tire puncture repair.
- Replace the expired sealant with a new part.
- The expiration date of a tire puncture repair sealant is shown on the label of the sealant bottle. The expired sealant is not included in the warranty.



(a) Expiration date display

WHEEL AND TIRE SYSTEM > Tire Repair Kit

REPLACEMENT

1. CLEARING THE TIRE PUNCTURE REPAIR SEALANT

Caution:

- **Do not dispose the tire filled with repair sealant.**
- **Expired sealant, recovered sealant, or empty bottles and hoses of sealant used for repair work contains ethylene glycol that is to be treated as industrial waste. Take appropriate measures to these materials at the time of disposal.**
- **Perform this operation in a well-ventilated space.**
- **During the operation, use appropriate protection tools to prevent the sealant from adhering to eyes, skin and clothes.**
- **After work, wash hands, face etc. well to wash away the sealant completely.**
- **If the sealant enters the mouth or eyes, wash it away with plenty of water, and consult a doctor.**

1. Using a tire changer, remove the tire from the wheel.

   Note:

   Cover the tire changer and floor with cloth, and work while being careful not to spill the sealant.

2. Clear the sealant remaining inside the tire.
3. Wipe off the sealant adhered to the wheel, inside the tire, tire changer and on the floor with cloth carefully.

Caution:

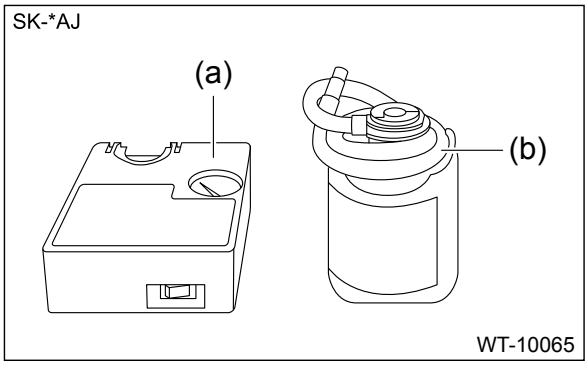
- **Completely wipe off the sealant in the mating surface of wheel rim and bead.**
- **Wheel can be reused even after repaired by using the tire puncture repair kit. Do not reuse the tire repaired with the tire puncture repair kit, the transmitter (tire inflation pressure sensor), and the valve.**

2. REPLACING THE TIRE REPAIR KIT

Caution:

After using the tire puncture repair kit, replace the repair sealant and the speed limit sticker.

Store a compressor (a) and a new repair sealant bottle (b) in the specified position of the vehicle.



INSPECTION

Symptoms	Possible cause	Corrective action
Vehicle is unstable.	(1) Improperly inflated tire	Adjust to the specified air pressure.
	(2) Uneven wear	Check the tire referring to "Abnormal tire wear" in this table, carry out the procedure and replace the tire.
	(3) Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	(4) Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	(5) Front strut	Check the front strut. Ref. to FRONT SUSPENSION>Front Strut>INSPECTION.
	(6) Rear shock absorber	Check the rear shock absorber. Ref. to REAR SUSPENSION>Rear Shock Absorber>INSPECTION.
	(7) Front axle housing	Check the front axle housing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Axle>INSPECTION.
	(8) Front hub unit bearing	Check the front hub unit bearing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>INSPECTION.
	(9) Rear axle housing	Check the rear axle housing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Rear Axle>INSPECTION.
	(10) Rear hub unit bearing	Check the rear hub unit bearing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Rear Hub Unit Bearing>INSPECTION.

Vehicle is abnormally out of balance.	(1) Improperly inflated tire	Adjust to the specified air pressure.
	(2) Uneven wear	Check the tire referring to “Abnormal tire wear” in this table, carry out the procedure and replace the tire.
	(3) Stabilizer	Inspect the stabilizer.
	(4) Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	(5) Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
Abnormal wheel vibration	(1) Improperly inflated tire	Adjust to the specified air pressure.
	(2) Uneven wear	Check the tire referring to “Abnormal tire wear” in this table, carry out the procedure and replace the tire.
	(3) Improper wheel balancing	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	(4) Front axle housing	Check the front axle housing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Axle>INSPECTION.
	(5) Front hub unit bearing	Check the front hub unit bearing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Front Hub Unit Bearing>INSPECTION.
	(6) Rear axle housing	Check the rear axle housing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Rear Axle>INSPECTION.
	(7) Rear hub unit bearing	Check the rear hub unit bearing. Ref. to PROPELLER SHAFT / DRIVE SHAFT / AXLE>Rear Hub Unit Bearing>INSPECTION.

Abnormal tire wear	(1) Improperly inflated tire	Adjust to the specified air pressure.
	(2) Improper wheel balancing	Check the wheel balance. Ref. to WHEEL AND TIRE SYSTEM>Tire and Wheel>INSPECTION > WHEEL BALANCING.
	(3) Front wheel alignment	Check or adjust the front wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.
	(4) Rear wheel alignment	Check or adjust the rear wheel alignment. • Inspection: Ref. to FRONT SUSPENSION>Wheel Alignment>INSPECTION. • Adjustment: Ref. to FRONT SUSPENSION>Wheel Alignment>ADJUSTMENT.